| Notice of Allowability | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/782,799 | TAKEHARA, SHINTARO | |
| | Examiner | Art Unit | |
| | Adam R. Giesy | 2627 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *4/5/2007*.

2. ☒ The allowed claim(s) is/are *1,2,4-7,9 and 10 renumbered as 1-8*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER

## DETAILED ACTION

### *Allowable Subject Matter*

1. The following is an examiner's statement of reasons for allowance:.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 1, 2, 4-7, 9, and 10 are allowed over the prior art of reference.

Independent claim 1 is allowed since the claim recites a tracking error detection device for an optical disk apparatus using a modulation coding method in which a minimum value of a run-length is 1, the device comprising: a detecting unit which includes at least two detectors and detects a reflected light from a series of pits formed on an optical disk; a phase comparing unit which detects a phase difference of outputs of the at least two detectors; and a low-pass filter which smoothes an output of the phase comparing unit, **a cut-off frequency of the low-pass filter being higher than a frequency at which a spectrum of a modulation code recorded in the optical disk becomes -10 dB relative to a frequency component of a code before modulation and lower than a frequency at which the spectrum of the modulation code recorded in the optical disk becomes -5 dB.**

Claim 2 is allowed as being dependent upon aforementioned independent claim 1.

Independent claim 4 is allowed since the claim recites a tracking error detection device for an optical disk apparatus using a modulation coding method in which a minimum value of a run-length is 1, the device comprising: a detecting unit which includes four detectors diagonally arranged relative to a center of a pit formed on an optical disk and detects a reflected light from a series of pits formed on the optical disk; an adder which adds two outputs of two sets of two detectors diagonally arranged and outputting a first detection signal and a second detection signal; an equalizer which equalizes a waveform of the first detection signal and the second detection signal in order to compensate high-frequency components of the first and second detection signals; a binarizing unit which binarizes equalized first and second detection signals; a phase difference detecting unit which detects a phase difference of binarized first and second detection signals; and a low-pass filter which smoothes an output of the phase difference detecting unit, **a cut-off frequency of the low-pass filter being higher than a frequency at which a spectrum of a modulation code recorded in the optical disk becomes -10 dB relative to a frequency component of a code before modulation and lower than a frequency at which a spectrum of the modulation code recorded in the optical disk becomes -5 dB.**

Claim 5 is allowed as being dependent upon aforementioned independent claim 4.

Independent claim 6 is allowed since the claim recites a tracking error detection method for an optical disk apparatus using a modulation coding method in which a minimum value of a run-length is 1, the method comprising: detecting a reflected light

from a series of pits formed on an optical disk by using at least two detectors; detecting a phase difference of outputs of the at least two detectors; and smoothing the detected phase difference by using a low-pass filter **of which cut-off frequency is higher than a frequency at which a spectrum of a modulation code recorded in the optical disk becomes -10 dB relative to a frequency component of a code before modulation and lower than a frequency at which the spectrum of the modulation code recorded in the optical disk becomes -5 dB.**

Claim 7 is allowed as being dependent upon aforementioned independent claim 6.

Independent claim 9 is allowed since the claim recites a tracking error detection method for an optical disk apparatus using a modulation coding method in which a minimum value of a run-length is 1, the method comprising: detecting a reflected light from a series of pits formed on an optical disk unit by using four detectors which diagonally arranged relative to a center of a pit formed on the optical disk; adding two outputs of two sets of two detectors diagonally arranged and outputting a first detection signal and a second detection signal; equalizing a waveform of the first detection signal and the second detection signal in order to compensate high-frequency components of the first and second detection signals; binarizing the equalized first and second detection signals; detecting a phase difference of the binarized first and second detection signals; and smoothing the detected phase difference by using a low-pass filter **of which cut-off frequency is higher than a frequency at which a spectrum of a modulation code recorded in the optical disk becomes -10 dB relative to a**

**frequency component of a code before modulation and lower than a frequency at which a spectrum of the modulation code recorded in the optical disk becomes -5 dB.**

Claim 10 is allowed as being dependent upon aforementioned independent claim 9.

The closest prior art by Buchler (US Pat. No. 6,266,303 B1) discloses a tracking error device and method for an optical disc including a photodetector, a phase detector, and a low pass filter. Buchler does not disclose a cut-off frequency of the low-pass filter being higher than a frequency at which a spectrum of a modulation code recorded in the optical disk becomes -10 dB relative to a frequency component of a code before modulation and lower than a frequency at which a spectrum of the modulation code recorded in the optical disk becomes -5 dB.

***Conclusion***

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam R. Giesy whose telephone number is (571) 272-7555. The examiner can normally be reached on 8:00am- 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne R. Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ARG 7/6/2007

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER